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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,215	09/08/2000	David Castiel	10636/005001	3219

20985 7590 01/30/2003

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EXAMINER

AFSHAR, KAMRAN

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 01/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/658,215

Applicant(s)

CASTIEL ET AL.

Examiner

Kamran Afshar

Art Unit

2682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6,7 and 11-15 is/are allowed.
- 6) ☒ Claim(s) 1-3,8-10 and 16-23 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-3, 8,10,16-23 are rejected under 35 U.S.C. 102(a) as being anticipated by Castiel et al (U.S. Patent 5,845,206).

Regarding claim 1, Castiel discloses a satellite system, comprising: a plurality of satellites in inclined elliptical orbits, each satellite communicating with a portion of the Earth, at least a first group of satellites being in common orbits having the same, first, repeating ground track, and a second group of satellites being in common orbits having the same, second, repeating ground track, different than first ground track, each satellite communicating during only a portion of the elliptical orbit closest to apogee (See Abstract, Co. 2, Lines 21-37, Co. 3, Lines 6-50, Co. 5, Lines 9-34, FIGS. 7A-7G).

Regarding claim 2, Castiel discloses that the only a portion is approximately 60% of its total orbiting time (See Co. 3, Lines 6-25, Co. 5, Lines 11-33).

Regarding claim 3, Castiel discloses that each of first and second ground tracks define active portions closest to apogee that follow populated portions on the earth (See Co. 11, Lines 11-15, Co. 14, Line 56 – Co. 15, Line 3).

Regarding claim 8, Castiel discloses the apogee of the satellites are approximately 3/4 the altitude or less of geo stationary satellites (See Co. 15, Line 64 – Co. 16, Line 31).

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Regarding claim 9, Castiel discloses first group is optimized for covering the Western United States and second sub-constellation is optimized for covering at least the Eastern United States (See Co. 13, Line 35 – Co. 14, Line 16).

Regarding claim 10, Castiel discloses each ground track covers three continents (See Co. 7, Line 51 – Co. 8, Line 18, Co. 13, Lines 35-40).

Regarding claims 16, 17, 19, 20, 22, as discussed above in claim 1, meets the claim limitations (See Rejection claim 1).

Regarding claim 18, Castiel discloses the satellites are in 8 hour orbits, and each satellite peaks three times in each 24-hour day (See Co. 10, Line 57 – Co. 11, Line 2), wherein each of the peaks is located to follow a populated region (See Co. 11, Lines 11-15, Co. 14, Line 56 – Co. 15, Line 3).

Regarding claim 21, Castiel discloses the apogees are lower than the geosynchronous satellite altitudes (See Co. 15, Line 64 – Co. 16, Line 31), such that any observer who is not on or near the equator will observe the constellation satellites with an angular separation from the entire geostationary band of satellites, thus eliminating the possibility of either electronic or physical interference problems with geostationary band of satellites (See Co. 2, Lines 21-37).

Regarding claim 23, Castiel discloses the satellites have an orbital eccentricity of 0.51, the value for which the satellite's apparent angular orbital velocity most closely averages a value equal to the angular orbital velocity of a geostationary satellite. This eccentricity setting of 0.51 acts to hold the satellite within a small angular arc from a user underneath the satellite even

while the satellite's altitude is either increasing towards or decreasing from the actual elliptical apogee altitude (See Co. 8, Lines 20-45).

***Allowable Subject Matter***

3. Claims 6-7 and 11-15 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter: 6-7 and 11-15.

Regarding claim 6, Castiel (U.S. Patent 5,845,206) is the closest prior art to the application invention which discloses a communication system, comprising: a plurality of ground stations, each including communication equipment for communicating with a satellite in orbit; and a plurality of satellites in respective orbits (See Abstract, Co. 2, Lines 21-37, Co. 3, Lines 6-50, Co. 5, Lines 9-34, FIGS. 7A-7G). However, Castiel fails teaching the respective orbits including a first sub-constellation orbit with a plurality of satellites therein, each of plurality of satellites following a repeating ground track that repeats an integral number of times each day and each repeating ground track optimized for covering more than one specific land mass on the earth, including a first sub-constellation optimized for covering first land masses in the Northern Hemisphere, a second sub-constellation optimized for covering second land masses in the Northern Hemisphere, and a third sub-constellation optimized for covering third land masses in the Southern Hemisphere.

Regarding claim 11, Castiel (U.S. Patent 5,845,206) is the closest prior art to the application invention which discloses a communication system, comprising: a plurality of ground stations on respective land masses (See Co. 11, Lines 11-15, Co. 14, Line 56 – Co. 15, Line 3);

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and a plurality of satellites in elliptical orbits (See Abstract, Co. 2, Lines 21-37, Co. 3, Lines 6-50, Co. 5, Lines 9-34, FIGS. 7A-7G). However, Castiel fails teaching the plurality of satellites being in orbits in sub-constellations, each sub-constellation having a plurality of satellites and repeating ground tracks, which repeating ground tracks are each optimized to follow a plurality of land masses, each satellite operating only during a predetermined percentage of its orbit closest to its apogee, where two of sub-constellations cover land masses in the Northern Hemisphere and a third sub-constellation covers land masses in the Southern Hemisphere.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6 Claims 4, 5, would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claim 4, the prior art of record fails to disclose or render obvious fails further comprising a third group of satellites being in common orbits having the same, third ground track, different than first and second ground tracks.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


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- a. Peter Dondl U.S. Patent 4,827,421 discloses Telecommunications Satellite System On Quasi-Stationary Orbits.
- b. Alfred Cellier U.S. Patent 6,126,116 discloses Coordinatable System Of Inclined Eccentric Geosynchronous Orbits.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kamran Afshar whose telephone number is (703) 305-7373. The examiner can be reached on Monday-Friday.

If attempts to reach the examiner by the telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached @ (703) 308-6739. The fax number for the organization where this application or proceeding is assigned is (703) 872-9314 for all communications.

  
Kamran Afshar

  
1/24/03  
NGUYENT.VO  
PRIMARY EXAMINER

L Number	Hits	Search Text	DB	Time stamp
1	274	plurality adj3 (((ground or base) adj stations) or gateway) and satellite and orbit	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/24 09:55
4	208	(plurality adj3 (((ground or base) adj stations) or gateway) and satellite and orbit) and (Cover\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/24 09:56
5	1	((plurality adj3 (((ground or base) adj stations) or gateway) and satellite and orbit) and (Cover\$3)) and (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/24 09:56
6	12	((plurality adj3 (((ground or base) adj stations) or gateway) and satellite and orbit) and (Cover\$3)) and (continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/24 09:57
-	383	inclin\$4 adj2 orbit\$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 13:44
-	32	((inclin\$4 adj2 orbit\$3) and (ground adj track)) and apogee	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:22
-	4	((inclin\$4 adj2 orbit\$3) and (ground adj track)) and apogee and (group adj3 satellites)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 16:05
-	1	((inclin\$4 adj2 orbit\$3) and (ground adj track)) and apogee and (approximately adj 60% )	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:25
-	6	(inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj track))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:11
-	14	(inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj2 (track or station)))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:15
-	10	((inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj2 (track or station)))) and apogee	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:19
-	13	((inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj2 (track or station)))) and (approximately )	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:28
-	2	((inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj2 (track or station)))) and (highest adj altitude)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 15:30



-	10	((inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj2 (track or station)))) and (((highest or lowest) adj altitude) or (apogee))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:19
-	2	((((inclin\$4 adj2 orbit\$3) and ((first or second) adj2 (ground adj2 (track or station)))) and (((highest or lowest) adj altitude) or (apogee))) and (communicat\$3 adj3 (during or portion) adj3 (elliptical or orbit\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:42
-	8	(inclin\$4 adj2 orbit\$3) and (communicat\$3 adj5 (during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3) or apogee)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:16
-	110	(inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:18
-	46	((inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) and (((high\$3t or low\$3) adj altitude) or (apogee))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:38
-	40	((((inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) and (((high\$3t or low\$3) adj altitude) or (apogee))) and (communicat\$3 or (time adj4 (on or off)))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:49
-	4	((((inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) and (((high\$3t or low\$3) adj altitude) or (apogee))) and ((time adj4 (on or off)))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 16:54
-	10	((((inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) and (((high\$3t or low\$3) adj altitude) or (apogee))) and ((time or shut) adj5 (on or off))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 17:04
-	18	((((inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) and (((high\$3t or low\$3) adj altitude) or (apogee))) and ((time or shut) adj5 (on or off) or (active adj satellite))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/22 17:06
-	10	((((inclin\$4 adj2 orbit\$3) and ((during or portion or close\$3)) adj5 ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) and (((high\$3t or low\$3) adj altitude) or (apogee))) and ((active adj satellite))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:35
-	21	(inclin\$4 adj2 orbit\$3) and ((active adj satellite) or (start adj operation) or (switch adj on))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:20
-	46	(inclin\$4 adj2 orbit\$3) and (ground adj track)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:19
-	869	(ground adj track)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:28

-	6	((first or second) adj3 (ground adj track)) and (((active or inactive) adj3 satellite) or (start adj operation) or (switch adj on))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:31
-	31	(first or second) adj3 (ground adj track)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:25
-	6784	(ground adj (station or track))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:29
-	3940	(ground adj (station or track)) and (orbit or satellite)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:29
-	143	((ground adj (station or track)) and (orbit or satellite)) and (((active or inactive) adj3 satellite) or (start adj operation) or (switch adj (on or off)) or (time adj (on or off)))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 13:34
-	196	(( (ground adj (station or track)) and (orbit or satellite)) and (((active or inactive) adj3 satellite) or (start adj operation) or (switch adj (on or off)) or (time adj (on or off))) ) and (((incl\$4 adj2 orbit\$3) or ((during or portion or close\$3)) or ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) or (((high\$3 or low\$3) adj altitude) or (apogee))) or ((active adj satellite))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 14:02
-	105	(( (ground adj (station or track)) and (orbit or satellite)) and (((active or inactive) adj3 satellite) or (start adj operation) or (switch adj (on or off)) or (time adj (on or off))) ) and (((incl\$4 adj2 orbit\$3) and ((during or portion or close\$3)) and ((elliptic\$3 or orbit\$3 or Ellipso or Eccentric) or apogee)) or (((high\$3 or low\$3) adj altitude) or (apogee))) or ((active adj satellite))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 14:05
-	1181	(ground and tracking and stations) and satellite and orbit	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 14:51
-	98	((ground and tracking and stations) and satellite and orbit) and ((first or second) adj2 ground)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 15:00
-	44	sub-constellation	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 15:00
-	18	sub-constellation and (optimiz\$3 or optimis\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 15:04
-	6	(plurality adj3 (((ground or base) adj stations) or gateway) and satellite and orbit) and ((North\$3 or south\$3) adj Hemisphere)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 15:40

-	42	castiel.in.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 16:10
-	10	castiel.in. and (second and first and track and stations)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 16:24
-	10	castiel.in. and (second and first and track\$3 and stations and repeat\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 16:27
-	8	(castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 16:44
-	6	((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:04
-	1	((((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated) and group\$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:06
-	1	(((((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated) and group\$3) and ((Northern near Hemisphere) or (the Southern Hemisphere))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:06
-	6	((((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated) and ((Northern near Hemisphere) or (the Southern Hemisphere))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:24
-	6	(((((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated) and ((Northern near Hemisphere) or (the Southern Hemisphere))) and (three near continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 18:30
-	1	((ground adj track) adj (cover\$3)) adj3 (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:47
-	1	(ground adj track) adj4 (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:47
-	0	(ground adj station) adj4 (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 17:48
-	0	(base adj station) adj4 (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 18:10

-	0	(gateway) adj4 (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/24 09:56
-	1	covers adj4 (three adj continents)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 18:11
-	0	(((((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated) and ((Northern near Hemisphere) or (the Southern Hemisphere))) and (three near continents)) and (interference and ovserv\$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 18:30
-	6	(((((castiel.in. and (second and first and track\$3 and stations and repeat\$3)) and (orbit\$3 near time)) and populated) and ((Northern near Hemisphere) or (the Southern Hemisphere))) and (three near continents)) and (interference and observ\$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/23 18:31